

NIST HANDBOOK 150-22 CHECKLIST

Instructions to the Assessor: This checklist addresses the general accreditation criteria prescribed in the NIST Handbook 150-22, *NVLAP Voting System Testing*, (2007 Edition). The checklist items are numbered to correspond to the requirements found in Clauses 4 and 5 of the Handbook.

Place an "X" beside each checklist item that represents a nonconformity. Place a "C" beside each item on which you are commenting for other reasons. Record the item number and written nonconformity explanation and/or comment on the comment sheet(s) at the end of the checklist. Write "OK" beside all other items you observed or verified as compliant at the laboratory.

4 Management requirements for accreditation

4.1 Organization

4.1.1

OK The laboratory shall establish and maintain policies and procedures for maintaining laboratory impartiality and integrity in the conduct of voting system testing.

Paragraph 1.1 (CIBER Liabilities and Eligibility) of the Quality Practice Manual covers this item.

OK When conducting testing under HAVA, the laboratory policies and procedures shall ensure that:

OK a) The laboratory cannot perform both developmental testing and accredited testing of a particular voting system or system component;

Paragraph 1.1.2 (Laboratory Staff Eligibility) covers this; it states "The ITL only pursues testing business opportunities and does not contract for any work requiring the Software Development Life Cycle."

OK b) The laboratory cannot provide consultation or other services to a voting system developer such that the independence, or appearance of independence, in the testing of a voting system or system component would be compromised.

Paragraph 1.1.2 (Laboratory Staff Eligibility) covers this; it states "The ITL only pursues testing business opportunities and does not contract for any work requiring the Software Development Life Cycle."

OK 4.1.2 The laboratory shall have physical and electronic controls augmented with an explicit policy and set of procedures for maintaining separation, both physical and electronic, between the laboratory test personnel and laboratory consultants, product developers, system integrators, and others who may have an interest in and/or may unduly influence the outcome of the test.

Paragraph 18.1.4 of the QPM addresses Network Security. Huntsville is a separate organization as per Par. 1.3 of the QPM. Also, Par. 1.4 (Conflict of Interest - Corporate Level) is pertinent to this element of 150-22.

4.2 Management system

4.2.1

OK a) The controlled version of the laboratory management system documentation may be paper-based or computer-based. Version control shall be maintained in either case.

It is computer based (on the portal) and it has version control.

OK b) If both methods are used, one or the other will be identified as a primary source with the other having the status of a copy (e.g., historical, archive, working, distribution).

Computer based.

4.2.2 The following general management system procedures (required, but not limited to) should be available for assessor examination prior to the on-site visit (if requested), but in any event shall be part of the on-site assessment process:

OK a) Internal audits and management review;
Available on the Road Map of procedures.

OK b) Writing and implementing system procedures;

OK c) Writing and implementing system instructions;

OK d) Staff training and individual development plans;

OK e) Contract review;

OK f) Staff members who work at home and at alternate work sites outside the laboratory (e.g., telecommuting);

OK g) Referencing NVLAP accreditation and use of the NVLAP symbol.
In the Quality Practice Manual.

4.2.3 The following program-specific procedures (required, but not limited to) should be available for assessor examination prior to the on-site visit (if requested), but in any event shall be part of the on-site assessment process:

OK a) Review of the vendor Technical Data Package (VSS-2002, Volume II, Section 2 and VVSG-2005, Volume II, Section 2);

CBR07-ADMPP-00012

X b) Selecting the laboratory staff for the certification test campaign;
No procedure was evident for this.

OK c) Writing a Certification Test Plan for first-time testing and testing of modified systems (VSS-2002, Volume II, Appendix A and VVSG-2005, Volume II, Appendix A);

CBR07-ADMPP-06002

OK d) Writing Test Operation Procedures (VSS-2002, Volume II, Appendix A.6.4 and VVSG-2005, Volume II, Appendix A.6.4);

CBR07-ADMPP-46001, CBR07-ADMPP-00025

OK e) Conducting testing at a customer's site (if the laboratory offers such services);
CBR07-ADMPP-00008 - reviewed the procedure and found it acceptable.

- OK f) Writing a National Certification Test Report (VSS-2002, Volume II, Appendix B and VVSG-2005, Volume II, Appendix B);
CBR07-ADMPP-07001
- OK g) Reviewing the Configuration Management Plan (VSS-2002, Volume II, Section 2.11 and VVSG-2005, Volume II, Section 2.11);
CBR07-ADMPP-00012 - Paragraph 13 (Configuraton Management Plan)
- OK h) Ensuring the protection of proprietary information against threats from persons outside the laboratory, from visitors to the laboratory, from laboratory personnel without a need to know, and from other unauthorized persons;
Paragraph 18.1.2 (Security) of the QPM is appropriate as is Par. 18.1.3 (visitor control).
- OK i) Performing security testing, (VSS-2002, Volume II, Section 6.4 and VVSG-2005, Volume II, Section 6.4);
CBR07-ADMTO-13003 in conjunction with the Colorado division will cover this item.
- OK j) Cooperating with the EAC during test campaigns;
CBR07-ADMPP-00022
- OK k) Witnessing of system build and installation;
CBR07-ADMTO-40001 and CBR07-ADMTO-13004.
- OK l) Matrix cross-referencing the laboratory's test methods to the voting system standard. Specific test methods will be checked for compliance with the standard.
Traceability Matrix Process (CBR07-ADMPP-00030) and the Requirements to Test Methods Cross Reference Matrix (CBR07-ADMFO-0001)

4.3 Document control

There are no requirements additional to those set forth in NIST Handbook 150.

4.4 Review of requests, tenders and contracts

- OK 4.4.1 The procedures for review of contracts shall include procedures to ensure that the customer understands that its products and systems must meet the requirements of HAVA, the VSS-2002, VVSG-2005, and the EAC.
Step 5 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.
- OK 4.4.2 The review shall include (but is not limited to):

 - OK a) laboratory competencies and resources to provide the service,
Step 3 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.
 - OK b) Vendor-supplied documentation,
Step 3 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.
 - OK c) Tests to be conducted,
Step 3 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.
 - OK d) Testing in additional Certification Testing,
Step 3 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.

- OK e) And subcontracting.
 Step 3 of paragraph 4.1 (Request for Proposal) of the Quality Practice Manual covers this item.
- X 4.4.3 Procedures for the review of requests, tenders, and contracts should include provisions to ensure that any state certification testing does not replace or dilute National Certification requirements.
 Procedures for the review of requests and contracts did not include provisions to ensure state certification testing does not replace or dilute National Certification requirements.
- OK 4.4.4 When conducting a contract review, the VSTL should determine if there are any special or changed requirements from the EAC or from state or local election authorities.
 Par. 4.1.1 (Changes to Contracts) of the QPM covers this item.
- 4.5 Subcontracting of tests and calibrations**
- 4.5.1**
- OK a) Subcontracting of tests is the use of laboratory services outside of the VSTL to perform tests, e.g., electromagnetic compatibility testing, environmental testing, shock and vibration testing, and FIPS 140 validation.
 Paragraph 5.2 (Non-Core Testing) of the QPM is appropriate.
- OK b) It may also include contracting of services for equipment needed to support testing but not part of the core test requirements such as test equipment calibration or the monitoring and operation of an environmental test chamber to support the 48-hour environment portion of the accuracy and reliability tests.
- OK c) The word *subcontracting* is not used to describe a mechanism by which the laboratory employs staff members (see 5.2.7).
- X 4.5.2 All core voting system testing shall be conducted by a VSTL. If the VSTL subcontracts testing for any test within its scope of accreditation, the subcontracted laboratory shall also be an EAC-accredited VSTL authorized to do business in the United States.
 Not evident that "all core voting system testing shall be conducted by a VSTL" is in the Quality Manual.
- 4.5.3**
- OK a) Subcontractors for non-core testing do not need to be accredited under the VST LAP. If laboratories accredited in another LAP are available for non-core testing, VSTLs shall use accredited laboratories.
 Paragraph 5.2 (Non-Core testing) is appropriate.
- OK b) When an accredited laboratory is not available for non-core testing, the VSTL shall conduct an audit of the subcontracted laboratory and shall document that the laboratory is competent and qualified for use.
 Paragraph 5.2 (Non-Core testing) is appropriate.
- 4.5.4**

- OK a) When a VSTL subcontracts to another laboratory, the VSTL is responsible for ensuring that setup, configuration, testing, and reporting is competent, appropriate, and conducted by qualified people.
Paragraph 5.2 (Non-Core testing) is appropriate.
- OK b) The VSTL shall ensure that there are no gaps in the knowledge required to conduct the testing. For example, a VSTL subcontracting with another laboratory to conduct temperature cycling tests should conduct the functional testing itself rather than allowing the subcontractor to do so.
The Hardware Testing Process (CBR07-ADMPP-00029) covers this.
- OK c) The VSTL is responsible for ensuring that the entire voting system is properly tested.
The Hardware Testing Process (CBR07-ADMPP-00029) covers this. Also, the Off-Site Test Management Procedure covers this in Paragraph 3.1 (Integration lead).
- 4.6 Purchasing services and supplies**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.7 Service to the customer**
X The customer shall not operate the equipment during testing.
No evidence of this requirement in the CIBER documentation.
- 4.8 Complaints**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.9 Control of nonconforming testing**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.10 Improvement**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.11 Corrective action**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.12 Preventive action**
There are no requirements additional to those set forth in NIST Handbook 150.
- 4.13 Control of records**
OK **4.13.1** The laboratory shall set policies and procedures on the retention of records that meet the requirements of HAVA and the EAC and meet the needs of its customers as agreed in a contract.
Covered in Paragraph 13.1 (General) of the Quality Practice Manual.

OK 4.13.2 Laboratory records shall be maintained, released, or destroyed in accordance with the laboratory's policy on proprietary information and contractual agreements with customers.

Covered in Paragraph 13.1 (General) of the Quality Practice Manual.

OK 4.13.3 The Certification Test Report plus the laboratory's records of the certification test shall contain sufficient information to allow repeating, reproducing and/or auditing the entire certification test.

CBR07-ADMPP-06002 and CBR07-ADMPP-07001 and the accompanying templates (CBR07-ADMTP-06001 and CBR07-ADMTP-07001).

4.14 Internal audits

X 4.14.1 The internal audit shall cover the laboratory management system and the application of the management system to all laboratory activities, including compliance with NVLAP, HAVA, VSS-2002, VVSG-2005, contractual, laboratory management system, and any additional EAC requirements.

Internal audit does not presently cover all the items in the management system.

N/A 4.14.2 a) In the case where only one member of the laboratory staff is competent to conduct a specific aspect of a test method, and performing an audit of work in this area would result in that person auditing his or her own work, then the audit may be conducted by another staff member.

OK b) The audit shall cover the methodology for that test method and shall include a review of documented procedures and instructions, adherence to procedures and instructions, and review of previous audit reports.

CBR07-ADMPP-00007 - CIBER ITL Internal Audit Procedure covers this item.

OK c) External experts may also be used in these situations.

OK 4.14.3 The laboratory shall perform at least one complete internal audit of its management system prior to the first on-site assessment.

CIBER Test Lab Internal Audit Report for an internal audit done September 4-6, 2007 was reviewed and found acceptable.

4.15 Management reviews

OK The laboratory shall perform at least one management review prior to the first on-site assessment.

The lab had a series of management meetings in lieu of a management review; each one of the management meetings covered different aspects of the management system.

5 Technical requirements for accreditation

5.1 General

C

The quality manual shall contain, or refer to, documentation that describes and details the laboratory's implementation of procedures covering all of the technical requirements in NIST Handbook 150 and this handbook.

Split between the QPM and TMVS. Delineated in the Table of Contents with actual references to the Hand Books (HBs). The cross references to the HB 150 and HB 150-22 in some cases are wrong but the titles are correct. Example: In TMVS, 5.4.2 should be 5.4.1. The one section off set is perpetuated through the section..

5.2 Personnel

OK

5.2.1 The laboratory shall maintain a competent administrative and technical staff appropriate for testing voting systems to be recognized by the EAC under HAVA.

Section 17.1 of the QPM is appropriate.

OK

5.2.2 The laboratory shall maintain a list of personnel designated to fulfill NVLAP requirements including: technical manager, Authorized Representative, Approved Signatories, and team leaders.

Technical Manager is Clive Robinson, Kelly Rohacek is the Authorized Representative and the approved signatory, and Phil Loughmiller (Quality Assurance Manager) and Clive Robinson (Technical Project Manager) are the team leaders.

OK

5.2.3 The laboratory shall notify both NVLAP and the EAC within 30 days of any change in key personnel. When key personnel are added to the staff, the notification of changes shall include a current resume for each new staff member.

Section 17.1 of the QPM is appropriate.

OK

5.2.4 Laboratories shall document the required qualifications for each technical staff position

Defined in the Training Matrix of the Ciber Test Lab Resources Matrix.

5.2.5

OK

a) The laboratory shall have documented a detailed description of its training program for new and current staff members.

Defined in the Training Matrix of the Ciber Test Lab Resources Matrix.

OK

b) Each new staff member shall be trained for assigned duties.

Defined in the Training Matrix of the Ciber Test Lab Resources Matrix.

OK

c) The training program shall be updated and current staff members shall be retrained when the VSS-2002 and VVSG-2005 changes, or when the individuals are assigned new responsibilities.

Par. 17.2 of the QPM is appropriate.

OK

5.2.6 The laboratory shall review annually the competence of each staff member for each test method the staff member is authorized to conduct. A record of the annual review of each staff member shall be dated and signed by the supervisor and the employee

Not appropriate since the lab is still new.

OK 5.2.7 Individuals hired to perform testing activities are sometimes referred to as *subcontractors*. NVLAP does not make a distinction between full-time laboratory employees and individuals hired on a contract. NVLAP requires that the VSTL maintain responsibility for and control of any work performed within its scope of accreditation. To that end, the VSTL shall ensure all individuals performing testing activities satisfy all NVLAP requirements, irrespective of the means by which individuals are compensated (e.g., the VSTL shall ensure all test personnel receive proper training and are subject to annual performance reviews, etc.).

Paragraph 17.1 of the QPM is appropriate.

5.2.8 The records for each person having an effect on the outcome of the testing shall include:

OK a) Position description;
Reviewed for: Y, S, G, C, P and J, D, N, K, (Denver CIBER Security subcontractors)

OK b) Resume/bio to match the person to the position;
Reviewed for Y, S, G, C, P and J, D, N, K (Denver CIBER Security)

OK c) Duties assigned;
Reviewed for Y, S, G, C, P and J D,N, K (Denver CIBER Security)

OK d) Annual competence review;

OK e) Training records and training plans.

C 5.2.9 In order to maintain confidentiality and impartiality, the laboratory shall maintain proper separation between personnel conducting testing and other personnel inside the laboratory or outside the laboratory, but inside the parent organization.

Paragraph 1.5.4 (Conflict of Interest) of the QPM is appropriate. It would be desirable to have something in writing that states that the Colorado security people are not bidding on other voting contracts..

5.3 Accommodation and environmental conditions

5.3.1

OK a) The laboratory shall have adequate facilities to conduct the voting system testing that it offers.

Lab and office space are both available.

OK b) If testing activities are conducted at more than one location, all locations shall meet the NVLAP requirements.

OK 5.3.2 A protection system shall be in place to safeguard customer proprietary hardware, software, test data, electronic and paper records, and other materials. This system shall protect the proprietary materials and information from personnel outside the laboratory, visitors to the laboratory, laboratory personnel without a need to know, and other unauthorized persons.

Paragraph 18.1.4 (Network Security) is appropriate for this section.

- OK 5.3.3 a) Laboratories shall have systems (e.g., firewall, intrusion detection) in place to protect internal systems from distrusted external entities.
Paragraph 18.1.4 (Network Security) is appropriate for this section.
- OK b) The laboratory shall have regularly updated protection for all systems against viruses and other malware.
Paragraph 18.1.4 (Network Security) is appropriate for this section.
- OK 5.3.4 If the laboratory is conducting multiple, simultaneous tests, it shall maintain a system of separation between the products of different customers. This includes the product itself, the test platform, peripherals, documentation, electronic media, manuals, testing area, office space, and records.
Paragraph 18.1.3 (Visitor Control) is appropriate. Also, Par. 18.1.5 (Separation of Manufacturer Laboratories) is also appropriate.
- OK 5.3.5 If testing activities will be conducted outside of the laboratory, the management system shall include procedures for conducting activities at customer sites or other off-site locations. For example, procedures may explain how to secure the site, where to store records and documentation, and how to control access to the test facility.
Off-site test management procedure is appropriate.(CBR07-ADMPP-00008).
- OK 5.3.6 If the laboratory is conducting its tests at a customer site or other location outside the laboratory facility, the environment shall conform, as appropriate, to the requirements for a laboratory environment.
Off-site test management procedure is appropriate.(CBR07-ADMPP-00008).
- OK If a customer's system on which a test is conducted is potentially open to access by unauthorized entities during test, the VSTL shall control the test environment. This is to ensure that the systems are in a defined state compliant with the requirements for the test before starting to perform testing work and that the systems ensure that unauthorized entities do not gain access during testing.
Off-site test management procedure is appropriate.(CBR07-ADMPP-00008).
- 5.4 Test methods and method validation**
- OK 5.4.1 The test methods for this program are given in the VSS-2002 and VVSG-2005. In the VSS-2002 and VVSG-2005, there are specified test methods, test methods that require adaptation, and requirements for which the laboratory shall have to develop test methods. When the EAC publishes amendments or augmentations to the standards or guidelines, the laboratory shall develop procedures for implementation of the new requirements.
Paragraph 3.1.2 (Selection of Methods) of the Test Methods for Voting Systems covers this issue.
- X 5.4.2 Where the laboratory has developed or modified test methods to meet the requirements of the VSS-2002 and VVSG-2005, validation of the test methods shall be referenced in the test report.
Requirements to Test Methods Cross Reference Matix (CBR07-ADMFO-00001) and the Traceability Matrix Process (CBR07-ADMPP- 00030) need to be strengthened.

- 5.4.3**
- C a) For the purposes of achieving product certification under HAVA, laboratories shall comply with interpretations of the test methods as provided by the EAC.

Implied in TVMS 3.1.3 EAC and test methods selected where approval of the tests through EAC is required but specific practices to recognize and process Interpretations by EAC is not part of a CIBER interpretation request
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- C b) When exceptions to the testing methodology may be necessary for technical reasons, the laboratory shall ask the EAC for an interpretation, the customer shall be informed, and details of an interpretation shall be described in the test report.

TMVS 3.1.3 EAC and test methods selected.. For followup visits, need to see evidence of the adaptation based on released EAC interpretations.

- OK **5.4.4** As a part of the testing procedure, the laboratory shall describe by whom and how the voting system will be configured. If the customer configures any part of the voting system, then the laboratory shall verify the configuration, including all software.

Paragraph 3.2.1 of the Test Methods for Voting Systems covers this.

- 5.4.5**
- OK a) Testing may be conducted at the customer site, the laboratory or another location that is mutually agreed to by the laboratory and the customer.

QPM 2.4/18.9.1 "Not a suggested service offered." Offsite Test Procedure is provided in case such testing becomes necessary.
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- C b) When testing activities are conducted outside the laboratory, the laboratory shall have additional procedures to ensure the integrity of all tests and recorded results. These procedures shall also ensure that the same requirements that apply in the laboratory are maintained at the non-laboratory site.

Offsite Test Procedure is provided in case such testing becomes necessary. Comment: may need to develop procedures for open networks if part of the setup Comment: 3.1.6 last paragraph is out of place but covers special case of environmental test lab conditions. Expect this to be removed..

- C **5.4.6** The laboratory shall clearly identify any test methods included in the test campaign that are outside of the laboratory's scope of accreditation.

In Paragraph 3.1.3, the sentence in the sub-paragraph entitled "EAC and test methods selected" that starts "Once the test methods have been defined.." must be edited and strengthened to fully satisfy this requirement.

- 5.5 Equipment**
- OK **5.5.1** For the purposes of this section "equipment" is defined as test equipment used in the testing process. Test equipment includes software and hardware products or other assessment mechanisms used by the laboratory to support the testing of products and systems.

Par. 3.2.1 (Awareness/Controls) of the Test Methods for Voting Systems covers this item.
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5.5.2
OK a) The laboratory shall document and maintain records on all test equipment used during testing.

Par. 3.2.3 (Equipment and Software Identification) of the Test Methods for Voting Systems document covers this item.

OK b) The laboratory shall have procedures to configure and operate all equipment within its control.

Par. 3.2.2 (Configuration Capabilities and Controls) of the Test Methods for Voting Systems document covers this item.

5.5.3
OK a) Equipment used during the conduct of testing shall be under configuration control.

C b) The laboratory shall have procedures to ensure that any equipment used for testing is in a known state prior to use for testing.

Such as test platforms using commercial operating systems

5.5.4
C a) Any software test tools shall be validated to be sure that they are accurately testing to the standard.

TMVS 3.2.3 partially covers but does not require formal validation

C b) They shall also be examined to ensure they do not interfere with the conduct of the test and do not modify or impact the integrity of the product under test in any way.

TMVS 3.2.3 partially covers but does not require formal validation. This requirement levies a special validation criteria against software test tools.

C c) VSS-2002 and VVSG-2005 require the documentation of the test software and supporting hardware in the certification.

Observation. The National Certification Test plan and Report includes this as A.3.2

5.6 Measurement traceability

OK All developed test methods and tests performed within the test campaign shall be traceable to the VSS-2002 and VVSG-2005. This validation shall be documented (e.g., cross-reference matrix).

Paragraph 3.3 (Measurement Traceability) of the Test Methods for Voting Systems document is appropriate.

5.7 Sampling

This section does not apply to the VST LAP since testing to the entire standard is required.

5.8 Handling of test and calibration items

OK **5.8.1** The laboratory shall maintain separation between and control over the items from different tests, to include the product being tested, its platform, peripherals, and all documentation.

OK **5.8.2** When the product being tested includes software components, the laboratory shall ensure that configuration management mechanisms are in place to prevent inadvertent modifications to the software components during the testing process. This includes the customer's software, test tools, and commercial off-the-shelf (COTS) software.

Paragraphs 3.2.2 (Configuration Capabilities and Controls) and 3.1.7 (Control of Data) in the Test Methods for Voting Systems document are appropriate. Also, the Configuration Management Procedure (CBR07-ADMPP-00021) is important for the details of the mechanism in place.

5.9 Assuring the quality of test and calibration results

X The laboratory procedures for test method validation shall include tests for abnormal conditions as well as normal operations where the program functionality includes requirements to detect and respond to invalid data, operator actions, or hardware malfunctions.

Paragraph 3.5 (Assuring the quality of test results) of the Test Methods for Voting Systems document needs to be strengthened to include abnormal conditions and normal conditions.

5.10 Reporting the results

5.10.1

OK a) Reports shall be submitted in the form and by the method specified in VSS-2002 and VVSG-2005.

Covered in Par. 3.6.1 (General) of the Test Methods for Voting Systems Document.

OK b) Information required to reproduce the test but not included in the Certification Test Report shall be kept by the laboratory as part of the testing records. For example, the report shall contain sufficient information for state certification officials to identify what testing was completed for the purpose of ascertaining what additional testing may be necessary at the state level.

Par. 4 (Quality Records) of the Test Methods for Voting Systems is appropriate.

OK **5.10.2** Reports intended for use only by the customer shall meet customer-laboratory contract obligations and be complete, but need not necessarily meet all other requirements.

Covered in the Scope of the National Certification Test Report Process (CBR07-ADMPP-07001).

OK **5.10.3** The section of a Certification Test Report that meets the VSS-2002 and VVSG-2005 requirements for a summary or the recommendation section of a test report for a customer shall also meet the requirements of NIST Handbook 150 on opinions and interpretations under *Reporting the results*.

Paragraph 5.4 (Opinions and Interpretations) of the National Certification Test Report Template covers this item.

